

BELLCOMM, INC.

SUBJECT: Trip Report - Second GP&D
Subpanel Meeting, MSFC,
June 15, 1967 - Case 600-1

DATE: June 26, 1967

FROM: K. E. Martersteck

ABSTRACT

The second meeting of the AAP Guidance, Performance and Dynamics Subpanel was held at MSFC on June 15, 1967. Among the items discussed were: cluster coordinate systems, schemes for improving launch vehicle performance, SPS suborbital ignition, OWS paint pattern and gravity-gradient dumping of ATM CMG's.

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SUBPANEL MEETING, MSFC, 15 JUNE 1967
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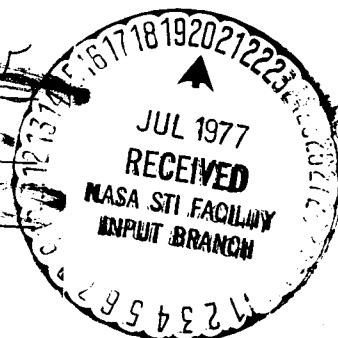
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MEMORANDUM FOR FILE

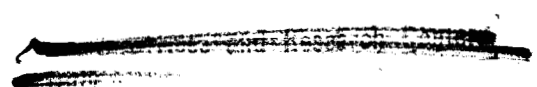
The second meeting of the AAP Guidance, Performance and Dynamics Subpanel was held at MSFC on June 15, 1967. Significant items discussed are outlined below.

1. There was a lively discussion about cluster coordinate systems. All parties agree that +X-axis should point along the vehicle longitudinal axis out the MDA axial port (#5). MSC has put the +Z-axis pointing out MDA port #3 while MSFC Astrionics Lab uses a system with +Z pointing out MDA port #1 (toward the sun during the LM/ATM mission). However, for mass properties determination, MSFC uses the launch vehicle coordinate system which is rotated 45° from the MSC system. Since each group has already done work and produced documentation in its respective system, no one wants to change to another system. There was no resolution for this problem at the meeting.

2. Following the MSFC presentation on various passivation schemes, MSC is now looking at the impact of the passivation on the CSM/Orbital Workshop rendezvous. The results will depend on the outcome of parallel studies of possible IU lifetime extension and the order of launch for the two flights.

3. MSFC is currently studying three schemes for improving launch vehicle performance on early AAP earth orbital missions: 2 1/2 stages-to-orbit (SPS suborbital ignition), utilization of ΔV from passivation dumping of vehicle fluids, and SLA and Nose Cone jettison during boost. Also, it was reported that recent MSFC/Aero-Astroynamics Lab calculations indicate an increase in uprated Saturn I performance of about 1000# due to the clustering effect on the thrust and I_{sp} of S-IB engines found in analyzing post-flight data and reduced power turbine takeoff in the J-2 thrust vector control.

4. R. Parten, MSC/MPAD, gave the 2 1/2 stage-to-orbit presentation which he had given at the AAP Weights Meeting at Headquarters on May 24 and again at the AAP MPTF meeting on June 1. The MPAD analysis concludes that the 2 1/2 stage-to-orbit mode is feasible, but there is need for automating the



SPS start sequence to minimize the time between J-2 shutdown and SPS start. The abort situation was also investigated. It was found that several abort modes using the solid rocket motors for retro thrust would be necessary to preclude landing in Africa. For launch along azimuths 72° - 84° and aborts between 789 and 819 seconds, land landings would still result.

5. MSFC is investigating for MSC which portions of the Orbital Workshop can be painted white. Present plans call for the S-IVB to be all black, which would make rendezvous difficult.

6. W. Chubb, MSFC/R-ASTR, gave a presentation on gravity-gradient dumping of the CMG's on the AAP-3/AAP-4 mission. Analyses of this scheme to date look encouraging and MSFC is looking at it further. It was stated that this scheme presents the most significant requirement for a special ATM computer.

The next GP&D Subpanel meeting will be held at MSC on July 25, 1967.



K. E. Martersteck

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